

Landscape Review:

Funding and Financing Resources for Vermont Farmers Interested in All-in Soil Health and the Delivery of Ecosystem Services

May 12, 2021

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This report is an output of the project titled *Coordinating Public and Private Funding with a Science-Based and Stakeholder-Driven Pay-for-Performance Conservation Approach*, which is funded by USDA-NRCS under Agreement # NR191644XXXXG002.

Executive Summary

This is an important moment in the history of Vermont Dairy. The recent dairy farm financial crisis has caused many farms to exit the industry; many remaining farms are seeking increased efficiency and financial performance. Farmers are losing money, farms are consolidating or exiting the industry. The water quality impact of dairy continues to be a challenge, with the state currently challenged to meet the Lake Champlain Phosphorus Total Maximum Daily Load (TMDL) issued by the U.S. Environmental Protection Agency (EPA).

At the same time, new research is starting to show that healthy soil can improve farm financial performance, by lowering input costs and increasing weather resilience, as well as reduce nutrient loss to surface and ground water and increase carbon sequestration. Farmers that build healthy soil can reduce their production and financial risk, as well as help to reduce external pressure on agriculture in the region related to environmental performance.

All-In Soil Health

There are many ways to improve soil health. Although not prescriptive on specific practices, the concept of “all-in soil health” is achieved by stacking multiple agronomic practices in appropriate combinations, such as cover crops, no-till, and soil-conserving crop rotations, or through well-managed grazing systems. All-in soil health (we use this term interchangeably with regenerative agriculture) has the potential to generate several crucial ecosystem services (ES), such as mitigating global climate change, improving water quality, and reducing the severity of flooding events. All-in soil health should also improve soil productivity and reduce costs of production, which would improve farm financial performance and resilience. As more farmers realize the benefits, all-in soil health is likely to become an on-going and permanent approach and adoption should increase over time.

All-in soil health produces improved water quality, carbon sequestration and flood resilience. These ESs are of great and increasing value to society and paying farmers is a very cost-effective way to secure them, as well as the rural community benefits that a healthy farm sector provides. Many farms will need to transform their production system to deliver these ES. Transformation can be risky and/or expensive and farms are likely to need financial and technical support.

What this Report Includes

This report attempts to describe the landscape of funding, financing, and technical assistance available to Vermont farmers who want to address ecosystem challenges and improve their farm’s financial performance. There are four types of support that can help farmers get to all-in soil health:

1. Funding for adopting soil health practices. This includes cost-share programs for soil health practices, and grants for technical assistance or equipment that will improve soil health (and deliver associated ecosystem benefit). In response to growing concern about water pollution, Vermont funding sources have emerged that focus on water quality and are funding projects or practices to improve water quality.
2. Direct payment for ecosystem services (a.k.a. environmental outcomes) generated from healthy soil. This includes public pay-for-performance programs and the emerging private outcomes markets.
3. Financing for farm transformations to regenerative systems. Regenerative systems improve soil health and the deliver economic and environmental benefits. In some cases, farm

transformation may require capital investment, in other cases it may require micro loans to mitigate risk and maintain cash flow during the transformation.

4. Other sources of capital that could be used to accelerate soil health improvements.
5. Technical and business planning assistance.

Key Learnings from our Research

Most current funding is associated with the implementation of specific practices. The focus on practices, rather than on outcomes, will be less cost-effective due to the high variability of outcomes from any given practice across different fields or farms. A practice-based incentive does not harness the profit motive and the farmer ingenuity that comes along with it. If incentives were tied to environmental outcomes, the funding would most likely have a much greater bang-for-the-buck.

There are a growing number of public and private entities interested in paying for environmental outcomes and/or investing in projects that achieve environmental outcomes. Being able to demonstrate the environmental outcomes from agriculture will unlock new sources of funding for soil health.

The current funding and financing are not adequate to drive rapid adoption of soil health and meet the state's water quality goals. Therefore, based on the work of this project, we encourage the State of Vermont to explore a "Soil Health Trust" to accelerate the realization of soil health, and the associated economic and environmental benefits across the state. The Trust would coordinate access to technical assistance, financing and funding for farmers who focus on soil health and who deliver the desired and associated ecosystem benefits. The Trust concept is described in a separate "Recommendations Report" submitted by this project.

Overview and Context

This report is part of a project that hopes to help farmers improve their farm's financial and environmental performance by transforming their farms to regenerative systems delivering all-in soil health. Creating all-in soil health on Vermont farmland will require funding, financing, and technical assistance. This report provides an inventory of the existing resources. The resources apply to all farmers but are focused on dairy farmers.

The inventory of resources in this report are organized into the following five major sections.

1. Funding for Adopting Soil Health Practices
2. Direct Payments for Ecosystem Services or Environmental Outcomes
3. Financing for Farm Transformation to Regenerative Systems
4. Other Sources of Capital
5. Technical and Business Planning Assistance

Table 1. Summary of Funding and Financing for Soil Health in Vermont

Type of Funding	Program/Agency/Player
Funding for adopting Soil Health Practices	<ul style="list-style-type: none"> • Cost Share: USDA: EQIP, CSP, RCPP; AAFM: FAP, BMP, GWFS; RD: REAP. • Clean Water Fund Grants for Agriculture: VHCB Water Quality Grants, AAFM Capital Equipment Assistance Program • Water Quality Financing (Clean Water State Revolving Fund)
Direct Payments for Environmental Outcomes or Ecosystem Services	<ul style="list-style-type: none"> • Public Programs: RCPP PFP (Phosphorous Reduction), VT Environmental Stewardship Program • Private Programs (ESMC, Indigo Ag, Carbon Markets, Supply Chain Programs) • <i>Non-VT Case Study: Soil and Water Outcomes Fund (Iowa) and Brandywine-Christina (Chesapeake Bay)</i>
Financing for farm transformation to regenerative systems	<ul style="list-style-type: none"> • NGO's: High Meadows, Taproot, Castanea, VT Community Loan Fund • DBIC • VLT/Farmland Futures • USDA-FSA Conservation Contracts • Traditional financing (easements, FSA, Farm Credit, VEDA, VACC, WLEI loans) • <i>Non-VT Case Study: RePlant Capital</i>
Other sources of capital	<ul style="list-style-type: none"> • Rural Development Grants and Programs (Value-Added Producer Grants, Rural Business Development Grants)
Technical and Business Planning Assistance	<ul style="list-style-type: none"> • USDA, UVM Extension, VHCB, AAFM

Vermont Agriculture and Food System Plan 2021-2030 includes a Food System Financing Inventory. This is a listing of capital providers who help to finance farm and food businesses, including debt, equity, and royalty financing, as well as various grant programs. The inventory is a supplemental document to the Vermont Agriculture & Food System Strategic Plan 2021-2030 as requested by the Vermont Legislature as part of Act 83/S.160 (2019). It can be found [here](https://www.vtfarmtoplate.com/resources/food-system-financing-inventory). <https://www.vtfarmtoplate.com/resources/food-system-financing-inventory>.

Funding for Adopting Soil Health Practices

There are three main types of funding for soil health practices.

1. **Cost-share funding for implementing conservation practices** comes from several types of programs. Some are designed to cost share the implementation of conservation practices. This includes the Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP), NRCS Regional Conservation Partnership Program (NRCS RCPP), Farm Services Agency (FSA) Conservation Stewardship Program (CSP) and Rural Development (RD) Rural Energy for America Program (REAP). At the State level, the Agency of Agriculture, Food, and Markets (AAFM) augments NRCS funding through Farm Agronomic Practices (FAP), Best Management Practice (BMP), Grassed Waterways and Filter Strip (GWFS), and other practices cost-share programs. Most of these programs offer technical assistance as well as cost share for

the implementation of soil health practices. The payment to the farmer is based on estimated costs of implementing the specific practices or on predetermined payment rates and is not based on a quantified environmental outcome.

2. **Grants for the implementation of soil health and water quality projects.** This includes the Vermont Housing and Conservation Board (VHCB) Water Quality Grants, the Capital Equipment Assistance Program (CEAP). This work is funded primarily through the Clean Water Fund and Capital Funds, under the management of the Clean Water Board. The Clean Water money goes to the Department of Environmental Conservation (DEC) for implementation of clean water projects; to AAFM's Clean Water Fund Grants and Contracts, to the Capital Equipment Assistance Program (CEAP), and to the Vermont Housing and Conservation Board (VHCB) Water Quality Grants. It is also used for TA in support of water quality projects on agricultural land.
3. **Financing for Water Quality.** The Clean Water State Revolving Fund (CWSRF) is a federal-state partnership to provide low-cost financing for water quality projects. It was created in 1987 within the federal Clean Water Act (CWA) and is administered by the U.S. Environmental Protection Agency (EPA). Funding is awarded to DEC for state implementation.

Cost Share Programs for Soil Health Practices

FEDERAL PROGRAMS

The Farm Bill conservation programs are the single largest source of conservation funding for private landowners. The working lands programs aim to improve the environmental performance of a farm and enhance farm profitability. The two largest working lands programs are EQIP and CSP. In addition, RCPP leverages outside sources of funding to amplify the impact of federal programs. REAP funds similar practices to EQIP, based on the energy savings associated with the practice.

[EQIP \(Environmental Quality Incentives Program\)](#)

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/vt/programs/financial/eqip/>

EQIP is the go-to program for initiating new conservation practices on farms and is the program that introduces many farmers to conservation. EQIP offers cost-share payments for individual conservation practices as part of a comprehensive farm plan and nutrient management plan.

[CSP \(Conservation Stewardship Program\)](#)

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/>

The soil health activities that CSP funds include cover crops, conservation covers, crop rotation, conservation crop rotation, contour buffers, filter strips, nutrient management and more. To encourage stacking practices (and thus achieve better conservation and financial results), CSP encourages the bundling (or stacking) of practices. Each bundle has three or more required enhancements, and for some bundles, the applicant has the option to pick additional enhancements from a select list that addresses specific resource concerns. Bundles receive a higher level of financial assistance to encourage the holistic approach to generate additional conservation benefits.

[RCPP \(Regional Conservation Partnership Program\)](#)

[nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/rcpp/](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/rcpp/)

RCPP is funded by USDA and administered by state, watershed, or other organization. The idea underlying RCPP is that federal funds can be used to leverage state and private funds and fully engage private sector partners to demonstrate innovative solutions to conservation challenges. All RCPP projects

must develop and report on their environmental outcomes. The RCPP language in the 2018 Farm Bill allows up to 30% of the funds to be spent using a pay-for-performance approach.

Lake Champlain Regional Conservation Partnership Program (LC RCPP)

This project includes 25 organizations, agencies, businesses, and non-profits. The \$16 million project has helped increase BMP implementation, conserve important and environmentally critical agricultural lands, and restore and protect wetlands that are crucial to absorbing runoff and slowing floodwaters. DEC has received an additional \$10M to continue the work for five years.

The LC RCPP created innovative approaches to increasing conservation implementation. An example is the wetland incentive program that provided additional funds on top of NRCS payments to incentivize restoration and protection of critical wetland areas. These types of programs may create more opportunities for farm economic sustainability.

USDA Rural Development - Rural Energy for America Program (REAP)

<https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency/vt>

Most of the farm-related practices that REAP funds are also funded under EQIP and CSP. The Vermont USDA Rural Development office indicated that there is limited use of the REAP program among farmers in the region; most who are interested are using RCPP or EQIP funds instead. REAP can also fund equipment for the installation of energy efficient equipment, discussed later in this document.

STATE PROGRAMS

AAFM has several programs that offer cost sharing for soil health practices with the goal of achieving water quality outcomes (reduced erosion and agricultural waste discharges).

- [AAFM \(Agency of Agriculture Food and Markets\) Best Management Practices \(BMP\)](https://agriculture.vermont.gov/bmp) (<https://agriculture.vermont.gov/bmp>). The BMP Program is a voluntary program implemented by AAFM to assist farmers with on-farm improvements designed to abate non-point source agricultural waste discharges into the waters of the state of Vermont. The program offers free TA, plus financial assistance towards the costs of construction associated with the designated practices. This program can be added to cost-share funding through existing EQIP contracts.
- [Farm Agronomic Practice \(FAP\) program](https://agriculture.vermont.gov/fap) (<https://agriculture.vermont.gov/fap>). The FAP program pays farmers to implement rotational grazing, cover cropping, crop rotation changes, tillage changes, manure injection, and other field-based practices.
- [Grassed Waterway and Filter Strip \(GWFS\)](https://agriculture.vermont.gov/gwfs) program (<https://agriculture.vermont.gov/gwfs>). The GWFS program is designed to address critical source areas for nutrient loss. It provides TA for planning and design, as well as funding for installation of grassed waterways and filter strips. Any acres put into grassed waterways or filter strips are eligible to be harvested, which helps to reduce the opportunity costs to the farmer.
- [Pasture and Surface Water Fencing \(PSWF\)](https://agriculture.vermont.gov/pswf) Program (<https://agriculture.vermont.gov/pswf>) Provides technical and financial assistance managing pasture to keep livestock out of surface waters. It covers the costs for fencing and chargers, water systems, and stream crossings.

Clean Water Fund Grants for Agriculture

Agriculture has a role to play in water quality through practices that reduce nutrient run off and increase flood resilience. Soil health practices as well as other on-farm changes can improve water quality. State Clean Water Funding (Clean Water Fund and Capital Fund dollars) money goes to the Department of Environmental Conservation (DEC) for implementation of clean water projects; to AAFM's Clean Water Fund Grants and Contracts, to the Capital Equipment Assistance Program (CEAP); and to the Vermont Housing and Conservation Board (VHCB) Water Quality Grants. It is also used for TA in support of water quality projects on agricultural land.

Capital Equipment Assistance Program – AAFM, Water Quality Equipment Purchase

<https://agriculture.vermont.gov/ceap>

The Vermont Agency of Agriculture, Food, and Markets (AAFM) oversees the Capital Equipment Assistance Program (CEAP). It provides financial assistance for new or innovative equipment that will aid in the reduction of surface runoff of agricultural wastes to state waters, improve water quality of state waters, reduce odors from manure application, separate phosphorus from manure, decrease greenhouse gas emissions, and reduce costs to farmers when they apply manure. Applications to fund equipment that will be used on multiple farms receives top priority.

AAFM Clean Water Fund Grants and Contracts - TA for Water Quality projects

Funded by the Clean Water Fund, the Agricultural [Clean Water Initiative Program](#)

(<https://agriculture.vermont.gov/agricultural-clean-water-initiative-program>) provides grants to organizations to support education, outreach, and technical assistance to help Vermont farms to comply with the State's Required Agricultural Practices (RAPs), implement water quality and soil health conservation practices, and reduce agricultural runoff to waters of the state.

VHCB Water Quality Grants - State, Water Quality Infrastructure

<https://www.vhcb.org/our-programs/vermont-farm-forest-viability-program/grants/water-quality-grants>

VHCB provides grants of up to \$40,000 to help Vermont farmers invest in water quality-related on-farm infrastructure. Projects must have direct, positive impacts on water quality. Funded by the State of Vermont. This unique program could be expanded with additional funding.

TA for Water Quality Projects: AAFM Agronomy Conservation Assistance Program

https://www.uvm.edu/extension/agriculture/agronomy_conservation_assistance_program_acap
ACAP provides direct technical assistance to animal agriculture operations in order to improve water quality in Lake Champlain and its tributaries. Administered by the Vermont VAAFM from the Clean Water Fund, with direct assistance provided by UVM Extension, and the Poultney-Mettowee Conservation District.

Water Quality Financing

Clean Water State Revolving Fund

<https://dec.vermont.gov/water-investment/water-financing/cwsrf>

The Vermont CWSRF issues very low or no interest **loans** with deferred payment. Loans must relate to water quality improvement. They can be used to acquire land or where there are capital costs associated with an on-farm project with water quality benefits. In each funding cycle, CWSRF sets aside funds for "interim projects" that are available on short notice and can be used to support conservation.

Typically, they will take on the least risk of any investor and are replaced by VHCB or another entity that will hold the land or an easement. CWSRF funded the Farmland Future Fund with VLT (see below). VLT provides project administration and manages the interface with farmers (CWSRF is not set up to be easy for an individual farmer to access and has limited resources for project administration).

A significant challenge faced by the CWSRF is that many farms are too highly leveraged to be credit-worthy. In other states, SRFs have been used to create Linked Deposits, but banks may not have the risk tolerance to invest in Vermont's highly leveraged farms. CWSRF funds could be used to restructure debt, but only the portion of debt that is associated with water quality projects.

Payments for Ecosystem Services or Environmental Outcomes

Public Outcomes Programs

There is a growing interest in paying for environmental outcomes in Vermont. Vermont Act 83 calls on the Vermont AAFM to develop a plan for using payments for environmental outcomes to address water quality, soil health, and climate change mitigation from the state's agricultural land. AAFM oversees the Payment for Ecosystem Services (PES) Working Group to recommend financial incentives designed to encourage farmers in Vermont to implement agricultural practices that improve soil health, enhance crop weather resilience, increase carbon storage and stormwater storage capacity, and reduce agricultural runoff to waters.

The Global Warming Solutions Act requires the state to take further action to reduce GHG emissions. The current draft Vermont Climate Action Plan includes the objective of achieving long term sequestration and storage of carbon and promote best management practices to achieve climate mitigation, adaption, and resilience on natural working lands.

These Acts suggest a policy climate interested in paying farmers for quantified environmental outcomes. At this point, there is only one example of paying farmers directly for quantified outcomes.

Vermont Pay for Phosphorous Program

This program is funded by USDA through the Regional Conservation Partnership Program (RCPP) but administered by Vermont AAFM. In August 2020, NRCS allocated \$7 million over 5 years to VT AAFM for an innovative pay-for-performance approach that pays farmers for the pounds of phosphorus reduced by implementing conservation practices, as opposed to paying farmers a portion of the cost to install a practice.

Each field across a participating farm will be entered into the Farm Phosphorus Reduction Planner (Farm-PREP), which will estimate phosphorus (P) loss from fields based on field-specific soils, slope, climate, crop, tillage, and nutrient information. P runoff will be modeled from historic TMDL management scenarios and compared with current management. Any resulting P runoff reductions that exceed the established threshold will receive a payment per pound of P.

Aside from pilot-testing done by Winrock International and UVM (University of Vermont), this will be the first public pay-for-performance program in the state and should be an important test of the concept.

Vermont Environmental Stewardship Program (VESP)

<https://agriculture.vermont.gov/vesp>

The Vermont Environmental Stewardship Program was created by Act 64. It is a pilot program of the Agency of Agriculture, Food and Markets. It uses a combination of on-farm natural resource assessments and Cornell soil health tests, to ascertain the impact of current land-use practices. The resulting data is used to set customized environmental goals for the farm, and to enact a long-range plan encompassing a full range of regenerative farming practices.

To be certified under this new program, applicants must meet high environmental standards regarding nutrient management, sediment and erosion control, soil health, greenhouse-gas emissions and carbon sequestration, and pasture health. If the applicant meets the standards in each category, he or she will be awarded with a 5-year certification, an on-farm sign designating the farm as meeting high levels of environmental stewardship, and other recognition-based incentives.

This program allows farmers to receive recognition and perhaps premiums for demonstrated on-farm assessments. The program is currently in a pilot stage.

Private Outcomes Marketplaces

There are several emerging markets for Ecosystem Services that seek to connect entities (brands, for example) interested in purchasing “outcomes” with the farms that can create the outcomes. One of the challenges in ecosystem markets is defining, quantifying, verifying, and pricing the outcomes.

There are several possible private sector “buyers.” Multi-national companies are establishing Sustainable Development Goals related to climate, water, biodiversity and more. National and multinational companies could, if a market develops in Vermont, purchase carbon or ecosystem offsets from Vermont farmers, even if these companies do not operate in the state.

Emerging Carbon Markets

The [Climate Action Reserve](https://www.climateactionreserve.org/) (CAR) <https://www.climateactionreserve.org/>, [American Carbon Registry](https://americancarbonregistry.org/) (ACR) <https://americancarbonregistry.org/> and [Verra Standard](https://verra.org/) <https://verra.org/> register carbon credits for sale. At this point, these will have limited value to Vermont farmers. The cost to verify carbon accumulation is high, and the per acre payment is relatively low. However, Vermont-based Native Energy is doing an innovative program nationally to provide upfront payments to farmers to implement practices that could then produce credits.

Indigo Carbon

<https://www.indigoag.com/for-growers/indigo-carbon#what-is>

Indigo Carbon, a program of Boston-based Indigo Agriculture, supports farmers in adopting practices that improve soil health. They not operating in Vermont yet. Indigo is modeling the ecosystem benefits based on neural net/artificial intelligence models. As such, their computations about ecosystem value are not transparent.

Program overview

- Farmers adopt or advance at least one new carbon farming practice (adding cover crops, increasing cover crop diversity or growth period, reducing tillage or fertilizer use, or diversifying your rotation). Farmers cannot get paid for practices they are doing already.

- Farmers submit all field and management information
- Indigo models the increase in overall carbon sequestered and greenhouse gas emissions reductions on the farm
- Once the outcome results are verified by Indigo, and once Indigo sells the credits, the farmer is paid. The amount paid to the farmer depends on what price Indigo is able to sell it for.

[Ecosystem Services Market Consortium \(ESMC\)](https://ecosystemservicesmarket.org/)

<https://ecosystemservicesmarket.org/>

A non-profit organization bringing together a broad consortium of corporations, agricultural producer associations, NGOs, and technology companies. ESMC “stack” multiple ecosystem services to go beyond simply improving soil carbon and reducing greenhouse gases. The same land stewardship practices that impact soil carbon and greenhouse gas emissions oftentimes have additional benefits, such as improved water quality and water conservation, as well as biodiversity benefits such as habitat for pollinators, insects, and birds. ESMC’s marketplace will reward producers for all these benefits, not just carbon credits. Farmers and ranchers can manage their operations to improve environmental outcomes through practices that make the most sense for their production system. We look at each field holistically to capture the site characteristics, the entire set of management decisions and the resulting outcomes. Enrollment in the ESMC Program then provides producers with access to both supply chain reporting markets as well as more rigorous offset and compliance grade markets.

ESMC calculates “ecosystem service assets” (outcomes) based on the modeled outcomes of all management practices and site characteristics, not just individual conservation practices a farmer or rancher implements. ESMC’s market program, quantification approach, and models are calibrated and validated by region and by production system to ensure accuracy. ESMC will issue payments annually based on market prices.

Supply Chain Outcomes Initiatives

At this point, no brands are measuring outcomes in their agricultural supply chains. The only significant supply chain program associated with soil health is Ben & Jerry’s Caring Dairy Program. Although Ben & Jerry’s is interested in paying for outcomes, the program is currently practice-based. Supply chain actors need outcome measurement and verification protocols (which do not yet exist) to price and pay for outcomes. Until those have been developed and accepted, the programs will remain practices based.

Examples of Ecosystem Service Markets in Other States

How these funds work:

- Impact investors provide the capital liquidity/initial investment to farmers to implement soil health practices.
- The farmer implements the practices
- A third party verifies the outcomes that result from the practices
- The outcomes are bought by entities such as corporations, municipalities or other financing institutions that want to claim these outcomes, either as actual credits they have purchased, or as part of their Sustainable Development Goals, or to make other claims.

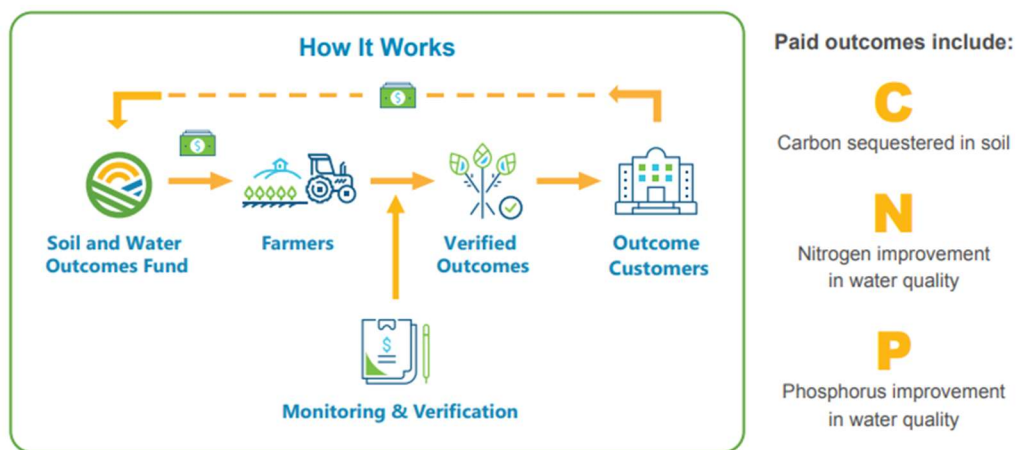
Two prominent examples are described here:

The [Soil and Water Outcomes](#) Fund, is a partnership of AgOutcomes (a subsidiary of the Iowa Soybean Growers Association) and ReHarvest Partners (a subsidiary of Quantified Ventures).

The Soil & Water Outcomes Fund provides financial incentives to directly to farmers who transition to on-farm conservation practices that yield positive environmental outcome like carbon sequestration and water quality improvement. In its first year (2020), operating across 9,500 acres in Iowa, the Soil and Water Outcomes Fund provided financial incentives of \$25-\$40 per acre to farmers and achieved the following environmental outcomes.

Their outcomes-based approach enables customers at public and private entities to achieve their regulatory and voluntary sustainability goals with reduced risk and increasing cost efficiency. By stacking together multiple outcomes from the same agricultural practices we achieve flexible and cost-competitive pricing for the outcomes our customers seek.

Customers include Cargill, the Fund's largest carbon credit customer, and several government agencies who have made water quality credit commitments, such as the NRCS RCPP, the Iowa Department of Agriculture and Land Stewardship; the City of Ames, Iowa; the City of Cedar Rapids, Iowa; and the County of Dubuque, Iowa. In February 2021, they announced a partnership with Nutrien Ag Solutions to launch a Carbon and Water Quality Outcome Program. With the significant support from these public and private sources, the fund plans to scale to more than 100,000 acres across at least three states - Illinois, Iowa, and Ohio - in 2021, with additional states under development.

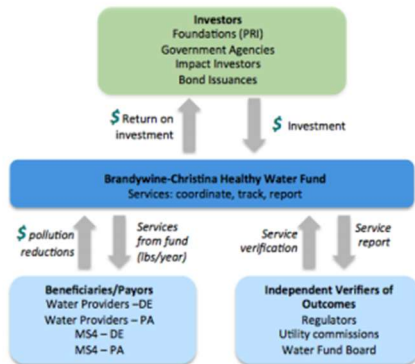


- 1) Participating farmers propose the conservation practice or practices they wish to implement.
- 2) The Soil and Water Outcomes Fund provides payments to participating farmers based on the environmental outcomes resulting from these practices.
- 3) These environmental outcomes are independently measured, monitored, and verified using a combination of models, in-field data collection, and remote sensing analysis.
- 4) Once verified, the environmental outcomes are sold to beneficiaries that may include corporations, municipal water or wastewater utilities, and state or federal government entities.

[The Brandywine-Christina Healthy Water Fund](#). Developed by The Nature Conservancy in Delaware and the University of Delaware's Water Resources Center under a grant from the William Penn Foundation as part of the Delaware River Watershed Initiative. The Fund advances the traditional water fund model by calculating the economic value of conservation measures and monetizing these values to create long-

term durability of conservation efforts. In 2017, i2 Capital received a Conservation Innovation Grant from the USDA's Natural Resource Conservation Service to further develop the commercial mechanisms of the Fund, to support scaled implementation of the Revolving Water Fund model.

The Fund model targets demand for water quality improvements from water providers, regulated municipalities, corporate end users and public beneficiaries. It seeks to develop an “Environmental



Impact Unit,” (EIU) which translates pollutant reductions from agriculture-based conservation practices into salable units of measure. The EIU employs commonly accepted pollution removal rates and applies geographically specific regulatory and land use constructs to align conservation supply and demand across the watershed, introducing a market mechanism for pollutant reduction. If successfully implemented, this ground-breaking metrics model will provide a proxy for sustained watershed investment programs across the United States.

1. The Fund manages a revolving fund of investment capital on behalf of impact-oriented investors.
2. Fund can be used for municipalities to implement green infrastructure, with repayment tied to regulatory approval or be used to pay farmers to implement BMPs
3. BMP’s create “environmental impact units” that can be sold by the Fund
4. Proceeds from EIU sales are reinvested in the Fund for future projects. This pilot project was launched in 2019.

Funding for Farm Transformation to Regenerative Systems

Financing for farm transformation tends to be in the form of loans, which may be stacked with payments for practices, our outcomes payments.

Currently, there are a small number of public and private sources of financing through which farmers can make changes to their operations that will, in addition to improving farm financial performance, will help to realize environmental benefits including carbon sequestration, water quality, and soil health. This section briefly describes some of these programs that are potentially available to Vermont farmers.

Public Funding Sources for Farm Transformation

Many of the public funding sources already listed could be used to achieve a farm transformation. However, they are not designed specifically for it.

Work being undertaken by the [Northeast Regional Dairy Business Innovation Center \(NE-DBIC\)](https://agriculture.vermont.gov/Northeast_Dairy_Business_Innovation_Center) (https://agriculture.vermont.gov/Northeast_Dairy_Business_Innovation_Center) is relevant to farm transformation to all-in soil health. NEDBIC funds technical assistance, contracts, and grants that benefit dairy businesses, including niche dairy products such as specialty cheese. They serve dairy farmers in Vermont, New England, and the Northeast region to support cow, goat, and sheep dairy businesses in the development, production, marketing, and distribution of dairy products.

As of early 2021, the NE-DBIC has received \$6.59 million from the USDA (United States Department of Agriculture) AMS (Agricultural Marketing Service) Dairy Business Innovation Initiative, with another

allocation expected in 2021. The NE-DBIC will award at least half of the federal funding to dairy farmers and value-added processors throughout the Northeast region. Currently, the funding from this program is fairly small per farm but could be an important part of a funding/financing package.

Two current NE-DBIC projects are aligned with the Trust and could fit within the Trust.

- **Grant Program for transition to grazing.** This program is designed to pay for TA (technical assistance) to help farmers transition to grazing. The cohort participating in the pilot is primarily conventional farms. The program offers farmers a newsletter, trips to visit other farm, and TA that lasts 18-24 months. The TA is provided through a competitive contract. At the end of the TA, the farmer awarded \$10k in non-competitive grant funding to use as needed to complete the implementation of the transformation. The pilot suggests that 10k might be more than is needed. The project encourages innovation and knowledge sharing. In their first pilot, they received 45k for TA and 45k in grant funds. In current budget proposal, they requested 800k for contracted TA and 400k for grant funds, half in 2021 and half in 2022. It is likely they will be running 4-8 TA contracts in this program across the entire region.
- **Development of value-added product supply chains** DBIC is also offering programs to help farmers get out of the conventional milk pricing system and into other system that encourage and reward products which certain characteristics; typically these require grazing, or more sustainable forms of production to create the desired attributes or components.

Private Impact Investment in Farm Transformation

Farm transformation improves farm financial viability and delivers environmental outcomes, thus meeting the dual needs of impact investors for impact and financial return.

Several Vermont non-profit organizations put capital to work to invest in farm transformation with the intent of making a return while improving the environment and/or farm viability. These entities pool private investment capital and invest in projects aligned with their mission. Their investment portfolios are not limited to farms; they also invest in food and agriculture production, processing, and distribution.

These investors would be important participants in the Soil Health Trust, described in the Recommendations Report. Their investment goals are aligned with the vision for the Trust. These entities could invest in the Trust, that would in turn coordinate resources to achieve efficient and cost-effective environmental impact and outcomes aligned with their mission.

Castanea Foundation

<https://castaneafoundation.org/>

Castanea Foundation was established to conserve and protect agriculturally productive and environmentally significant land and water resources in select areas of Vermont. Through grants and PRIs, Castanea develops and supports projects that protect land and foster economically viable, environmentally sustainable agricultural practices in order to conserve the environment and the working landscape. They operate throughout Vermont, with priority given to projects the Lake Champlain watershed in southwestern Vermont, and the Hoosic River and Batten Kill watersheds.

Dirt Capital

<https://www.dirtpartners.com/for-farmers>

Dirt Capital Partners invests in farmland in partnership with farmers throughout the Northeast United States, promoting sustainable farmers' land access and security. Based in Chatham, NY, they work with sustainable farmers who have successful, existing operations, established markets and the opportunity to grow and expand their business through long-term, secure land access. Dirt Capital invests alongside farmers. After taking ownership of the land, they craft long-term leases that allow businesses to expand securely, providing defined pathways to farm ownership. The invest in project from \$300,000 - \$3,000,000. Dirt Capital will work with farmers with over \$100,000 in annual gross revenue or projected gross revenue, who are organic or transitioning to organic.

High Meadows Fund

<http://www.highmeadowsfund.org/>

High Meadows Fund promotes vibrant communities and a healthy natural environment while encouraging long term economic vitality in Vermont. They particularly value social and marketplace innovation and collaboration. They make grants of \$20-50K and up to \$150K over three years, to institutions aligned with their mission. Their impact investing is in enterprises that encourage new farm, food, and forest businesses; land conservation; and building performance improvements that lower the reliance on fossil fuels in Vermont. High Meadows considers opportunities where the investment or loan is in a pooled fund, such as their \$1 million investment in VLT'S Farmland FuturesFund. The one direct farm investing mechanism is the Taproot Capital Fund (see below).

Taproot Capital Fund

In 2016, High Meadows and the Castanea Foundation established the Taproot Capital Fund to support projects with patient, risk tolerant capital as a catalyst to stimulate innovative but under-capitalized projects that support the conservation and ecological stewardship of Vermont's environment and working landscape and the vibrancy of its rural communities. Taproot's portfolio includes investments in Farmers to You LLC, High Mowing Organic Seed Company, Inc., The Intervale Conservation Nursery, Fat Toad Farm, and Eden Specialty Ciders.

Vermont Community Loan Fund

<https://www.investinvermont.org/invest/focus-funds/food-farms-and-forests-fund-investors.html>

The Vermont Community Loan Fund is a mission-driven, community-focused alternative lender providing loans and other resources to those who don't qualify for a loan from a traditional lender. The money they lend comes from impact investors.

- In 2015, they launched the [Food, Farms & Forests Fund](#) focused on small farms, food producers, and the working landscape throughout Vermont. They have invested \$670,000 since their launch. Their loans can be used for real estate/farmland acquisition, facility construction or improvement, equipment, inventory, or working capital. Loans from can be for a few months or up to 20 years and start at 6%.
- [SPROUT Loan Program](#) (<https://www.investinvermont.org/borrowers/business/sprout.html>) meets the financing needs of working lands entrepreneurs who might not otherwise be eligible for a VCLF loan, offering low interest loans for up to \$60k, paired with business planning assistance. While available to beginning farmers, these funds are targeted to agricultural businesses that are playing an important role in a local or regional food supply chain.

Public Private Partnerships

There is a great deal of interest in bringing together public and private capital to achieve all-in soil health. The case study that follows, from outside Vermont, shows one model.

Farmland Futures Fund (VLT and CWSRF)

Last year, the Clean Water State Revolving Loan Fund provided funding to the Vermont Land Trust's Farmland Futures Fund. With funding from CWSRF, VLT will purchase farmland that has conservation or water quality value. VLT will protect those values through easements or other restrictions and then sell the land to a new farmer. This will keep the land in agricultural production, while delivering environmental benefits, including water quality which is the goal of the CWSRF. Three million dollars was authorized this year and \$10 million over the next 10 years. As a loan to VLT, these funds must be repaid (it's not a grant program). This is a model for using CWSRF funds for agricultural projects.

Public-Private Partnership Example, Outside Vermont

[rePlant Capital](https://www.replantcapital.com/) <https://www.replantcapital.com/> seeks to improve farmer profitability and environmental outcomes through financing the transition of farmland to regenerative and organic agriculture. They focus on regenerative and organic because of research demonstrating the financial viability and improved environmental impact of these systems. They focus on farmers, but integrate private corporate supply chains, private investors, and public support and funding sources. Their approach is:

1. Create partnerships with food companies to directly access their supply chains
2. Develop financing options for farmers ready to transition to regenerative and organic agriculture
3. Connect farmers to TA from agronomists, soil conservationists, NGOs, etc.
4. Deploy capital to accelerate farmer transitions to regenerative and organic agriculture, tying financing terms to soil health.

In the Midwest, rePlant is working with Danone and other large food companies. The Danone farmers access Conservation Innovation Grant (CIG) funds through a grant obtained by Danone and the National Fish and Wildlife Foundation (NFWF) to help pay for the regenerative practices. Danone also provides funding to these farms and pays for a third party to verify the environmental outcomes. The CIG requires Danone to track the economic return from soil health investments. A white paper will be published with NRCS.

Other Sources of Capital

Other sources of capital that could provide cash to help farmers achieve all-in soil health include:

Financing Structures for Conservation (Debt Forgiveness, Easements)

Federal and state agencies and NGOs purchase easements or long-term contracts to use conservation on vulnerable land or take it out of production altogether. Payments associated with easements can offer a source of funds that help farmers invest in soil health practices. As such, they play an indirect, but potentially important role in achieving soil health on Vermont farmland.

Debt Forgiveness

The [FSA Conservation Contract Program](https://ask.usda.gov/s/article/What-is-the-Conservation-Contract-Program) (<https://ask.usda.gov/s/article/What-is-the-Conservation-Contract-Program>) offers partial debt forgiveness on real-estate backed loans in exchange for restricting

farming practices on marginal, highly erodible, or other environmentally sensitive crop land for 10 to 50 years. This program is limited to real estate with certain environmental values. The program prohibits livestock access (except to access drinking water) and agricultural production on the land. Up to 33% of debt can be forgiven in exchange for a conservation contract; this percentage can be higher for borrowers who are delinquent on their loans. According to FSA interviews, this program is rarely used any more, perhaps because the land that meets the program criteria and farmer production needs has been enrolled.

The rate of payment is based on the number of acres, the amount of debt, and the term of the easement. FSA indicated that typically the payment is not very significant unless the farmer has a lot of debt.

Although changing federal policy can take a long time, it seems possible that *this program could be expanded to offer debt forgiveness to farmers who improve the environmental performance of their land and farm operations through soil health. This is more nuanced than the current program and would be more complex to administer and verify.*

Compensation for Conservation

The Federal land set-aside programs are a suite of federal conservation programs designed to compensate farmers for taking certain lands out of production. Some are matched with state funds. These land set-aside programs could be drawn on in some circumstances to help improve the environmental and financial performance of a farm.

- The [Agricultural Conservation Easement Program](#) (ACEP) uses permanent easements, and 30-year easements and contracts with farmers to protect, restore and enhance wetlands, grasslands and working farms and ranches.
- [Conservation Reserve Program](https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/) (https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/) and [Conservation Reserve Enhancement Program](https://agriculture.vermont.gov/crep) (https://agriculture.vermont.gov/crep) pay yearly rental payments to farmers for taking environmentally sensitive land out of production. Contracts generally are 10 to 15 years. Cost-share and incentive payments are available to offset implementation costs associated with fencing, alternative water systems, stream crossings, and vegetative buffer establishment.

Private Funding for Easements

Both the [Vermont Land Trust](http://www.vlt.org) (VLT) (www.vlt.org) and the [Upper Valley Land Trust](http://www.uvltg.org) (UVLT) (www.uvltg.org) purchase permanent conservation easements from farmers. Often these are co-held with VHCB. Farmers could use cash from the sale of easements to implement improved soil health practices on the farm.

Traditional Sources of Farm Financing

Most farm debt in Vermont is through the Farm Credit System or commercial lenders. Interest rates are based on business risk. The cost and terms of this capital is not currently tied to soil health even though healthy soil impacts the value of the underlying asset. We highlight just the two most significant programs in the state.

Farm Credit System (Yankee Farm Credit)

<https://www.yankeefarmcredit.com/>

The Farm Credit System (FCS) is designed to provide credit to agriculture and related businesses nationwide. It is a privately-owned, for-profit, federally chartered cooperative and is a designated government-sponsored entity (GSE). FCS holds approximately 40% of the nation's private agricultural debt, which is about the same percentage held by all commercial banks.

Yankee Farm Credit is the branch of FCS that operates in Vermont. If there were a *demonstrated* connection between soil health and loan risk, it might enable them to set different rates for soil health projects. They would need much stronger data correlating soil health metrics with farm productivity and profitability to offer a lower interest rates based on soil health. Absent those metrics, with their governance structure and broad agricultural portfolio, Yankee Farm Credit does not envision adjusting lending terms based on a project's *potential* to improve soil health or water quality.

USDA-FSA Loan Program and Loan Guarantee Program

The USDA Farm Service Agency (FSA) provides credit to farmers who are unable to get private, commercial credit. In addition to long-term farm ownership loans and shorter-term operating loans, FSA guarantees loans from participating private lenders for conservation activities and practices approved by USDA-NRCS. This would include installing conservation structures, establishing or improving permanent pastures, implementing new manure management, and other conservation practices.

Vermont's Working Lands Enterprise Initiative (WLEI)

<https://workinglands.vermont.gov/>

The Working Lands Enterprise Initiative (WLEI) and governing board is a collaborative effort between the Agency of Agriculture, Food, and Markets, Department of Forest, Parks, and Recreation, and the Agency of Commerce and Community Development. It is designed to stimulate economic development in the agricultural and forestry sectors. WLEI has several programs that provide subsidized capital to assist farm businesses with real estate/farmland acquisition, facility construction or improvement, equipment, inventory, or working capital.

VACC (Vermont Agricultural Credit Corporation)

<https://www.veda.org/financing-options/vermont-agricultural-financing/vermont-agricultural-credit-corporation/>

A program of VEDA, VACC is a nonprofit corporation which provides credit to Vermont farmers, agricultural facilities, forestry, and forest product-based businesses. Farm loans are available to strengthen existing farm operations, encourage diversification, support beginning farmers, and to encourage marketing and processing of Vermont agricultural and forestry products. VACC supports conventional dairy farms transitioning to organic production through interest-free loans with deferred principal payments for up to the first two years, thanks to subsidies being provided by WLEB.

USDA Rural Development Funding

[Rural Development Rural Energy for America Program \(REAP\): Energy Income](https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency/vt)

<https://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency/vt>

REAP funds can be used for renewable energy systems. Farms that wish to add a revenue stream from sales of renewable energy, or to implement a capital project that would reduce energy costs (freeing up

cash for elsewhere) could use REAP. In Vermont, several dairies installed digesters through the CowPower Program.

Rural Business Development Grants (RBDG)

<https://www.rd.usda.gov/factsheet/rural-business-development-grants-rbdg>

RBDG is a competitive grant designed to support targeted technical assistance, training, and other activities leading to the development or expansion of small and emerging private businesses in rural areas that have fewer than 50 employees and less than \$1 million in gross revenues. Programmatic activities are separated into enterprise or opportunity type grant activities.

RBDG has been used to provide technical assistance and training to farmers and other small business owners, start revolving loan funds, and spur new business opportunities in rural communities. On-farm changes that improve the financial performance, resilience, and viability of Vermont farms could and should be considered investments in rural development. As such, funds from the RBDG program could be used by the Trust to increase its capacity to affect positive and sustained change in Vermont.

Rural Business Value Added Producer Grants (VAPG)

<https://www.rd.usda.gov/programs-services/value-added-producer-grants>

The VAPG program helps viable agricultural producers enter value-added activities related to the processing and marketing of new agricultural products. The goal of this program is to generate new agricultural products, create and expand marketing opportunities, and increase agricultural producer income. This program could be used to help a farmer develop an equipment leasing business, where the farmer leased out equipment needed for improved soil health (e.g., no-till planters, roller crimpers, etc.). The VAPG could help develop a business plan for such an entity or could provide a grant to help cover the costs of working capital or marketing.

Technical and Business Planning Assistance

The previous sections have discussed funding and financing that farmers could access for soil health, including payment for soil health practices, payment for ecosystem services (environmental outcomes), financing for farm transformation to a soil-health model.

In addition to money, business planning resources and technical assistance (TA) on production issues will be critical for farmers who want to adopt an all-in soil health management system. These farms could require TA for agronomic, livestock and business planning. In many cases, there are substantial existing resources to help farmers take a step towards soil health, but these are mostly focused on agronomic practices. Additional or reorganized resources could complement this valuable work by incorporating financial assistance as part of a more transformative approach.

Agronomic and Livestock Technical Assistance:

Most of the cost share programs include production technical assistance. In addition, the federal and state governments extensively fund technical assistance, through contracts with UVM Extension, VACD and other partners. Farmers also hire advisors directly.

Some of the current technical assistance resources available to Vermont farmers include:

- Intervale Foundation, <http://www.intervale.org>
- Northeast Dairy Business Innovation Center

- Northeast Organic Farming Association of Vermont, www.nofavt.org
- University of Vermont Extension, www.uvm.edu/extension/ag/links.htm
- USDA Natural Resource and Conservation Service, www.vt.nrcs.usda.gov
- UVM Center for Sustainable Agriculture, www.uvm.edu/sustainableagriculture
- Vermont Agency of Agriculture, Food and Markets, www.vermontagriculture.com
- Vermont Farm Bureau, www.vtfb.org
- Vermont Farm Service Agency, www.fsa.usda.gov
- Vermont Housing and Conservation Board, www.vhcb.org

Business Planning

Several organizations offer information, assistance, and encouragement Vermont farmers through one-on-one coaching and business planning. Their work involves financial analysis, enterprise budgeting, cash flow planning, developing full business plans, and succession and farm transfer planning.

The business advisory services described below are critical to farmers' adoption of soil health practices because they can help farmers understand the short- and long-term financial impacts of proposed changes to their farming operations. However, to support wide scale transformation to all-in soil health additional TA will be required.

Vermont Housing and Conservation Board Farm Viability Program

<https://vhcb.org/viability>

The Vermont Housing and Conservation Board (VHCB) coordinates the Vermont Farm Viability Program (VFVP). The Viability Program offers business planning and technical assistance to enterprises that keep Vermont's working landscape in production. Their farm business advisors often have some expertise in agricultural issues too.

UVM Extension Farm Viability Program

https://blog.uvm.edu/farmvia/?page_id=1590

The UVM Extension Farm Viability program helps advance your farm planning. Enrolled participants work one-on-one with a farm business educator to learn new management skills, access resources, and prepare business plans.

- Full Business Plan: Develop a comprehensive business plan that covers all aspects of the business for 1-3 years. Includes short / long term goals, marketing plans, management plans, risk analysis and financial statements.
- Transfer Plan: Planning focused on the unique relational, tax and legal consideration of transferring ownership and management of the farm to other people or parties.
- Enterprise Analysis Plan: Isolate and analyze one enterprise within your business or test the feasibility of a new idea.
- Cash Flow Plan: Develop budgets and update the financial statements needed to make key decisions or apply for financing.

Vermont Small Business Development Center

<https://www.vtsbdc.org/>

Since 1992, the Vermont Small Business Development Center has provided no-cost professional expertise and guidance to hundreds of business owners. We combine one-on-one confidential advising with training programs to give our clients the tools and insight they need to reach their business goals. While not focused on agriculture, they offer help with business planning, cash flow modeling and more.

Center for an Agricultural Economy (CAE) Farm & Food Businesses Advising
<https://hardwickagriculture.org/farmers-food-businesses/farm-food-businesses-advising>

CAE works with farms in all stages of development, from beginning to transitioning. They provide specialized support and business planning assistance to help farmers find new wholesale markets, improve cash flow, refine production systems, and achieve personal and professional goals necessary to sustain their farm business.

Conclusion: Gaps and Opportunities

Accelerating soil health is critical for Vermont agriculture: it will improve farm economic viability and will deliver essential ecosystem services.

After reviewing the existing sources of funding and financing, there are several improvement and adjustment that would accelerate the adoption of soil health in Vermont. These are:

1. Motivate farmers to focus on all-in soil health rather than one or two soil health practices. Research has shown that adopting multiple soil health practices will accelerate and amplify the economic and environmental benefits. Funding should recognize and reward stacking.
2. Pay farmers directly for outcomes which harnesses the wisdom of farmers to determine the most efficient path to achieving the ecosystem benefits.
3. Pay for outcomes. The pricing, verification, etc. structures are not in place to create a “market” to pay farmers for creating outcomes (water quality, carbon sequestration). Emerging pay for performance projects (RCPP Pay for Phosphorous, and the Pay-for-Performance work within this grant) are working to define outcomes, measurement, and verification processes. Continuing this work and expanding it to outcomes beyond Phosphorous will be important.
4. Simplify farmer access to funding by providing assistance to farmers and/or by creating a centralized coordinating entity. In some cases, it can be difficult and time consuming for farmers to access even the existing sources of funding. For example, it is difficult for farms to interface directly with the CWSRF.
5. Restructure farm debt. Many farmers have so much debt that they cannot risk making changes that might limit their cash flow. Restructuring this debt (perhaps by offering preferential terms for expected environmental outcomes) could free up cash to adopt new (soil health) practices.
6. Provide comprehensive and coordinated technical assistance that includes financial, agronomic, and animal science expertise. Financial, agronomic, and animal oriented TA is needed to support farmers in developing plans for all-in soil health.

The “Recommendations Report” prepared as part of this grant describes a framework for a “Soil Health Trust” that would aim to build on the excellent funding and financing resources already in place, while addressing these six gaps.